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THIN FILMS AND METHOD OF MAKING THEM USING TRISILANE

Abstract of the Disclosure

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Thin, smooth silicon-containing films are prepared by deposition methods that utilize trisilane as a silicon source. In preferred embodiments, the methods result in Si-containing films that are continuous and have a thickness of about 150 Å or less, a surface roughness of about 5 Å rms or less, and a thickness non-uniformity of about 20% or less. Preferred silicon-containing films display a high degree of compositional uniformity when doped or alloyed with other elements. Preferred deposition methods provide improved manufacturing efficiency and can be used to make various useful structures such as wetting layers, HSG silicon, quantum dots, dielectric layers, anti-reflective coatings (ARC's), gate electrodes and diffusion sources.

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